

## CLAIM AMENDMENTS

1           1. (currently amended) A method for locating a mobile  
2 terminal  $[(MS, MS2, \dots)]$  within a mobile communication network  
3 comprising at least one base station  $[(BTS1, BTS2, BTSn)]$ , the  
4 method comprising the steps of: measurement of

5           measuring a set of physical dimensions that identify,  
6 according to respective functions, locating coordinates  $(x, y, z)$   
7 of said mobile terminal, ~~characterized in that it comprises the~~  
8 ~~steps of:~~

9            $[-]$  generating, starting from said set of physical dimensions  
10 and respective functions, a global locating error function  $[(0)]$   
11 which has a minimum for values of said locating co-ordinates  $(x, y,$   
12  $z)$  corresponding with the position occupied by said mobile  
13 terminal, said global error function being the difference between  
14 the dimensions included in said set and zero,

15            $[-]$  seeking the minimum of said error function  $[(0)]$  by  
16 varying at least one of said locating co-ordinates  $(x, y, z)$ , and  
17            $[-]$  locating said mobile terminal in correspondence with the  
18 value of said at least one locating co-ordinate corresponding to  
19 said minimum.

1           2. (currently amended) The method as claimed in claim  
2 ~~1, characterized in that wherein~~ said set of physical dimensions  
3 comprises at least a dimension selected within the group  
4 constituted by:

5        [[-]]        signal power received by said mobile terminal starting  
6        from said at least one base station,  
7        [[-]]        timing advance [[(TA)]],  
8        [[-]]        observed time differences [[(OTD)]], and  
9        [[-]]        time of arrival [[(TOA)]].

1                    3.    (currently amended)    The method as claimed in claim 1  
2        or 2 ~~characterized in that~~ wherein the measuring step comprises the  
3        step of:

4        [[-]]        performing measurements able to identify at least a value  
5        of position or distance with determined precision.

4.    (canceled)

1                    5.    (currently amended)    The method as claimed in claim 1  
2        ~~, 2 or 3, characterized in that~~ wherein said global error is  
3        defined as the mean square error of the dimensions of said set.

1                    6.    (currently amended)    The method as claimed in any of  
2        the previous claims ~~, characterized in that~~ wherein said global  
3        error function [[(4)]] is obtained starting from a plurality of  
4        dimensions of said set.

1                    7.    (currently amended)    The method as claimed in claim 1  
2        ~~, 2 or 3, characterized in that~~ wherein said set comprises one

3 single dimension, so that said global error function  $[(4)]$  is  
4 generated starting from the single dimension of said set.

1 8. (currently amended) The method as claimed in ~~any of~~  
2 ~~the previous claims, characterized in that it comprises, claim 1,~~  
3 further comprising the step of:

4 to seek said minimum, ~~the execution of~~ executing an  
5 iterative process evaluating  $[(of)]$  said global error function for  
6 different values of said at least one location co-ordinate  $[(x_0,$   
7  $y_0, z_0...; y_n, z.)]$  corresponding to successive different points  
8 of the space covered by said communication network.

1 9. (currently amended) The method as claimed in claim  
2 ~~8, characterized in that it comprises~~ further comprising the step  
3 of:

4 interrupting said iterative process when the absolute  
5 distance between two successive points is below a determined  
6 threshold value.

1 10. (currently amended) The method as claimed in ~~any of~~  
2 ~~the previous claims, characterized in that claim 1 wherein it is~~  
3 applicable in a three-dimensional reference system.

1 11. (currently amended) A system for locating a mobile  
2 terminal  $[(MS1, MS2, ...)]$  within a mobile communication network  
3 comprising at least one base station  $[(BTS1, BTS2, BTSn)]$ , the

4 system comprising at least a locating module  $[(PCF)]$  configured  
5 to measure a set of physical dimensions that identify according to  
6 respective functions location co-ordinates  $\{x, y, z\}$  of said mobile  
7 terminal, ~~characterized in that~~ wherein said locating module  $\{PCF\}$   
8 is being configured to:

9  $[-]$  generate, starting from said set of physical dimensions  
10 and respective functions, a global locating error function  $[(4)]$   
11 which allows a minimum for values of said locating co-ordinates  $\{x,$   
12  $y, z\}$  corresponding with the position occupied by said mobile  
13 terminal, the global error function being the difference between  
14 the dimensions included in the set and zero,

15  $[-]$  seek the minimum of said error function  $[(4)]$  varying  
16 at least one of said locating co-ordinates  $\{x, y, z\}$ , and

17  $[-]$  locate said mobile terminal in correspondence with the  
18 value of said at least one locating co-ordinate  $\{x, y, z\}$   
19 corresponding to said minimum.

1 12. (currently amended) The system as claimed in claim  
2 ~~11, characterized in that~~ wherein said set of physical dimensions  
3 comprises at least one dimension selected in the group constituted  
4 by:

5  $[-]$  signal power received by said mobile terminal starting  
6 from said at least one base station,

7  $[-]$  timing advance  $[(TA)]$ ,

8  $[-]$  observed time differences  $[(OTD)]$ , and

9  $[-]$  time of arrival  $[(TOA)]$ .

1           13. (currently amended) The system as claimed in claim  
2 ~~11 or claim 12, characterized by, further comprising:~~

3           measuring devices able to obtain measurements to identify  
4 at least a position value of said mobile terminal or distance with  
5 a determined precision.

14. (canceled)

1           15. (currently amended) The system as claimed in claim  
2 ~~11 , 12 or 13, characterized in that wherein~~ said global error  
3 function is defined as the mean square error of the dimensions of  
4 said set.

1           16. (currently amended) The system as claimed in claim  
2 ~~11 , 12 or 13, characterized in that wherein~~ said locating module  
3 ~~[[PCF]]~~ is configured to obtain said global error function  
4 ~~[[(\$)]]~~ starting from a plurality of dimensions of said set.

1           17. (currently amended) The system as claimed in claim  
2 ~~11, 12 or 13, characterized in that wherein~~ said locating module  
3 ~~[[PCF]]~~ is configured to obtain said global error function  
4 ~~[[0)]]~~ starting from said set comprises one single dimension, so  
5 that said global error function ~~[[0)]]~~ is generated starting from  
6 the single dimension of said set.

1           18. (currently amended) The system as claimed in ~~any of~~  
2 ~~the claims from claim 11 through 17, characterized in that wherein~~  
3 to seek said minimum, said locating module  $[(PCF)]$  is configured  
4 to carry out an iterative process for evaluating said global error  
5 function for different values of said at least one locating  
6 co-ordinate  $[(Y_0, z_0:-..; x_n, y_n, z_n)]$  corresponding to the  
7 successive different points of the space covered by said  
8 communication network.

1           19. (currently amended) The system as claimed in claim  
2 ~~18, characterized in that wherein~~ said locating module  $[(PCF)]$  is  
3 configured to interrupt said iterative process when the absolute  
4 distance between two successive points is below a determined  
5 threshold value.

1           20. (currently amended) The system as claimed in ~~any of~~  
2 ~~the claims from claim 11 to 19 characterized in that wherein~~ said  
3 error function  $[(0)]$  is able to operate in a three-dimensional  
4 reference system.

1           21. (currently amended) The system as claimed in ~~any of~~  
2 ~~the claims from claim 11 to 20, characterized in that it further~~  
3 ~~comprises , further comprising:~~

4           a module  $[(MGC)]$  to allow the exchange of data between  
5 said mobile terminal and said at least one base station to identify  
6 at least one dimension of said set.

1           22. (currently amended) The mobile terminal configured  
2 for use in a system as claimed in ~~any of the claims from~~ claim 11  
3 ~~to 21, characterized in that~~ wherein the terminal comprises at  
4 least part of said locating module ~~[(PCF)]~~ integrated in the  
5 mobile terminal itself.

1           23. (currently amended) A software product able to be  
2 loaded directly into a memory of a digital computer associated with  
3 a mobile terminal ~~[(MS1, MS2,...)]~~ as claimed in claim 22 and  
4 comprising portions of software code able to implement said at  
5 least part of said locating module ~~[(PCF)]~~ integrated in the  
6 mobile terminal itself when said software product is run on said  
7 digital computer.

1           24. (currently amended) A communication network  
2 comprising at least a base station ~~[(BTS1, BTS2, BTSn)]~~ and a  
3 plurality of mobile terminals ~~[(MS1, MS2, ...)]~~, the network  
4 comprising a locating system as claimed in ~~any of the claims from~~  
5 claim 11 ~~[[to 21]]~~.

1           25. (currently amended) The communication network as  
2 claimed in claim 24, ~~characterized in that it comprises~~ further  
3 comprising an interface module ~~[(GW)]~~ for interfacing with an IP  
4 network, said interface module being configured in such a way as to  
5 allow the transfer of at least one between:

6        [[-]]        an order to locate one of said mobile terminals starting  
7        from a source [[(U)]] connected to said IP network, and  
8        [[-]]        a delivery information generated by a source [[(U)]]  
9        connected to said IP network, directed to said mobile terminals  
10       [[(MS1, MS2, ...)] and referred to the location of at least one of  
11       said mobile terminals.